REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 21 and 24 are amended. No claims are added or canceled. Claims 1-26 are pending in this application.

35 U.S.C. § 102

<u>Claims 1, 8, 9, 11, 12, 17, 19, 21 and 24</u>

Claims 1, 8, 9, 11, 12, 17, 19, 21 and 24 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Number 5,781,896 issued to Dalal (hereinafter "Dalal"). Applicant respectfully traverses the rejection.

Anticipation is a legal term of art. Applicant notes that in order to provide a valid finding of anticipation, several conditions must be met: (i) the reference must include <u>every element of the claim</u> within the four corners of the reference (see MPEP §2121); (ii) the elements <u>must be set forth as they are recited</u> in the claim (see MPEP §2131); (iii) the teachings of the reference <u>cannot be modified</u> (see MPEP §706.02, stating that "No question of obviousness is present" in conjunction with anticipation); and (iv) the reference <u>must enable</u> the invention as recited in the claim (see MPEP §2121.01). Additionally, (v) these conditions must be simultaneously satisfied.

The §102 rejection of claims 1, 8, 9, 11, 12, 17, 19, 21 and 24 is believed to be in error. Specifically, the PTO and Federal Circuit provide that §102 anticipation requires that <u>each and every element</u> of the claimed invention be disclosed in a single prior art reference. *In re Spada*, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990). The corollary of this rule is that the absence from a cited §102 reference of <u>any</u> claimed element negates the

anticipation. *Kloster Speedsteel AB, et al. v. Crucible, Inc., et al.,* 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986).

No §103 rejection has been lodged regarding claims 1, 8, 9, 11, 12, 17, 19, 21 and 24. Accordingly, if Applicant can demonstrate that Dalal does not disclose any one claimed element with respect to claims 1, 8, 9, 11, 12, 17, 19, 21 and 24, the §102 rejections must be withdrawn, and a subsequent non-final action made with a different rejection in the event that the Examiner still finds any of such claims to be unallowable.

Applicant notes the requirements of MPEP §2131, which states that "TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM." This MPEP section further states that "'A claim is anticipated <u>only if each and every element as set forth in the claim is found</u>, either expressly or inherently described, in a single prior art reference.' *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). 'The identical invention must be shown in as complete detail as is contained in the ... claim.' *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). <u>The elements must be arranged as required by the claim</u>, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required. *In re Bond,* 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."

Claim 1 recites "a method for processing a database query," comprising: "partially pre-aggregating records in a database according to at least one grouping column" "to provide **a result that contains at least two records having like grouping column values**." (Emphasis added). Claim 1 also recites the step of

"aggregating records derived from the partial pre-aggregation to provide a result that contains records having unique grouping column values."

Partial aggregation is defined in the specification (p. 15):

> [T]he output stream from pre-aggregation may contain multiple records related to the same customer, each one covering a subset of that customer's invoices. Traditional, complete aggregation always outputs a single record for each customer. This is the difference between *partial* pre-aggregation and pre-aggregation.

A partial aggregation (or partial pre-aggregation as used in the example) is an incomplete aggregation, so to speak, that may be performed as a preliminary step in a database query. Normally after an aggregation is completed, no two records contain a grouping column value that is the same as the grouping column value of another record.

Dalal does not disclose or anticipate a partial aggregation or pre-aggregation. The operations disclosed in Dalal are merely aggregations that Applicant has distinguished from the claimed pre-aggregation.

In a previous Office Action, the Office stated that a "multiple aggregation query in Dalal is a query that utilized more than one grouping column, aggregating one grouping column at a time, sequentially – this is clearly partial aggregation."

Applicant contends that this is NOT partial aggregation and that the Office is relying on this particular view to base the rejection. Such reliance is erroneous.

Applicant points out that the process disclosed and described in Dalal is a process that is well known in the art and referred to as a "group by with rollup" operation. The "group by with rollup" operation is supported by all major databases in the art. The "group by with rollup" operation may also be referred to as "grouping sets" (at least in SQL).

Fig. 11 of Dalal is an explicit example of a "group by with rollup" operation, even though not specifically referred to as such in the reference. Fig. 11 can be described as performing a "group by" operation on the 'Salesperson' column and, subsequently, performing a "rollup" operation on the 'Division' column. In other words, the "rollup" operation means that the Level 1 Result Tables are grouped by 'Division'. As a practical matter, the operation described by Fig. 11 comprises two consecutive grouping operations.

Dalal does *not* disclose or anticipate only *partially* aggregating each grouping column. The examples shown and described in Dalal clearly indicate that a full aggregation is performed on the grouping columns because after each aggregation, **each grouping column value in the grouping column that was aggregation is unique,** i.e. no two grouping column values are alike. This element is fundamental to all the claims in the Application.

If the example shown in Dalal were applied to claim 1, then a first partial pre-aggregation on the "Salesperson" grouping column would produce a result that contained non-unique grouping column values. But this is not the case in Dalal, since each "Salesperson" value in Fig. 11 is unique.

Per claim 1, another aggregation would subsequently be performed on the partial pre-aggregation result, so that each grouping column value was unique in the final result. This subsequent aggregation is a complete aggregation as is known in the art and described in the specification.

Likewise, a second partial pre-aggregation on the "Division" grouping column would produce a result that contained non-unique grouping column values. Again, this is not shown in Fig. 11 (or in Dalal in general) because the "Division"

column of the Level 2 Result Table contains only unique values. Claim 1 requires at least two equivalent values.

After such a partial pre-aggregation, a typical aggregation operation would be performed on the partial pre-aggregation result, so that each grouping column value was unique in the final result.

In summary, the "group by with rollup" operations (referred to in Dalal as a "multiple-level aggregation") disclosed in Dalal is not a partial aggregation. As a matter of logic, the aggregations included in the multiple-level aggregation must be performed sequentially. However, the described operation – whether referred to as a "group by with rollup" or as a "multiple-level aggregation" – does not rise to the partial pre-aggregation that is required by claim 1.

Accordingly, claim 1 is not anticipated by Dalal and is allowable over the cited reference. The rejection, therefore, should be withdrawn.

Claims 8, 9 and 11 depend from claim 1 and are allowable by virtue of that dependency.

Claim 12 recites a relational database system that includes, *inter alia*, a record store and a query processor configured "to process a query on the record store according to at least one grouping column, the query processor being configured to partially pre-aggregate the record store to provide a result that contains **at least two data records that have like grouping column values**." (Emphasis added).

As previously discussed in the response to the rejection of claim 1, a typical aggregation does not result in any two records having an identical grouping column value as required by claim 12. The operations referred to in Dalal are sequential aggregations - one follows the other. But these sequential aggregations

are two independent, complete aggregations – neither of the sequential aggregations is a partial aggregation.

Also, the previous discussion of how Dalal merely discloses a "group by with rollup" operation that is well known in the art also applies to claim 12, since claim 12 requires a partial pre-aggregation operation.

Therefore, Dalal does not disclose or anticipate a partial aggregation or partial pre-aggregation. As a result, claim 12 is allowable over the cited reference and the rejection thereof should be withdrawn.

Claims 17 and 19 depend from claim 12 and are allowably at least by the same reasoning discussed in the response to the rejection of claim 12. Therefore, the rejection of claims 17 and 19 should also be withdrawn.

Claim 21 recites a relational database computer program that comprises "partial pre-aggregation code to partially pre-aggregate data records according to at least one grouping column value to provide a partial pre-aggregation result having two or more records having like grouping column values." The relational database computer program also includes "aggregation code" that aggregates the result of the partial pre-aggregation.

Again, it is noted that – similar to claims 1 and 12 – the current amendment to claim 21 substantially restores claim 21 to its original language. After further review of the references, Applicant has determined that the previous amendment language is unnecessary to distinguish the disclosed invention from the cited references.

As previously discussed, Dalal merely discloses a "group by with rollup" operation (i.e. a multiple level aggregation) that does not include partial

aggregation. Therefore, Dalal does not disclose or anticipate a partial pre-aggregation operation as required in claim 21. .

Accordingly, claim 21 is allowable over the cited references and the rejection of claim 21 should be withdrawn.

Claim 24 recites a relational database computer program comprising computer-executable instructions that perform several steps. The steps include "aggregating each input record in the stream" to create a record store, "joining records in the record store with other data," and aggregating the records output from the join. Claim 24 also makes clear that "the records output from the join include **at least two records that have an identical grouping column value.**" This restriction, in essence, renders the first aggregating step a partial aggregation.

As previously discussed, the cited reference only describes an aggregation, a multiple level aggregation, and/or a "group by with rollup" operation wherein no records output from an aggregation contain an identical value in the grouping column. The identical values cited in the Office Action are contained in a grouping column on which the aggregation was not performed. The operations disclosed in Dalal are merely typical aggregations that completely aggregate records on a grouping column so that no record resulting from the aggregation contains an identical value in the aggregated grouping column. This is contrary to claim 24. After a first complete aggregation is performed, a second complete aggregation is performed on another grouping column.

Claim 24 clearly recited a partial aggregation that is not disclosed in any reference. As a result, claim 24 is allowable over Dalal and the rejection thereof should be withdrawn.

35 U.S.C. § 103(a)

Claims 2-5, 13-15, 20, 22, 23 and 25

Claims 2-5, 13-15, 20, 22, 23 and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dalal in view of U.S. Patent Number 6,115,705 issued to Larson (hereinafter "Larson"). Applicant respectfully traverses the rejection.

Larson was filed on May 19, 1997 and issued on September 5, 2000. The instant application was filed on June 30, 2000. As such, Larson qualifies as prior art only under the timing provisions of 35 U.S.C. §102(e).

Larson is assigned to the Microsoft Corporation, Redmond, WA. The instant application is also assigned to the Microsoft Corporation of Redmond, WA.

As such, Larson is not available as prior art under 35 U.S.C. 103, as is discussed in more detail in MPEP §706.02(l)(1), entitled "Rejections Under 35 U.S.C. 102(e)/103; 35 U.S.C. 103(c)". This MPEP section cites 35 U.S.C. 103(c):

> 35 U.S.C. 103. Conditions for patentability; non-obvious subject matter.
> (c) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

More specifically, this MPEP section states that "Effective November 29, 1999, subject matter which was prior art under former 35 U.S.C. 103 via 35 U.S.C. 102(e) is now disqualified as prior art against the claimed invention if that subject matter and the claimed invention "were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person." This change to 35 U.S.C. 103(c) applies to all utility, design and plant patent applications filed on or after November 29, 1999, including continuing

applications filed under 37 CFR 1.53(b), continued prosecution application filed under 37 CFR 1.53(d), and reissues."

Accordingly, Larson is not available as prior art under 35 U.S.C. §103 with respect to this application, and, as such, the rejection of claims 2-5, 13-15, 20 and 23-25 is prima facie defective. Additionally, no other grounds for rejection have been lodged regarding claims 2-5, 13-15, 20 and 23-25. Accordingly, in the event that the Examiner still finds such claims to be not allowable, a subsequent non-Final action must be made with different grounds for rejection.

The preceding notwithstanding, Applicant also presents the following arguments with respect to the claims rejected under § 103(a).

Claims 2-5 depend from claim 1 and are allowable at least by virtue of that dependency for the reasons stated in the response to the rejection of claim 1. Neither reference teaches or suggests a partial aggregation or partial pre-aggregation. As discussed above, this makes the claims allowable over the cited references and the rejection of these claims should be withdrawn.

Claims 13-15 and 20 depend from claim 12 and are allowable at least by virtue of that dependency for the reasons stated in the response to the rejection of claim 12. The addition of Larson does not remedy the noted deficiency previously discussed because Larson does not teach or suggest partial aggregation or partial pre-aggregation.

Accordingly, the rejection of claims 13-15 and claim 20 should be withdrawn.

Claims 22 and 23 depend from claim 21 and are allowable at least by virtue of that dependency for the same reasons set forth in the response to the

rejection of claim 21, above. Accordingly, the rejection of these claims should be withdrawn.

Claim 25 depends from claim 24 and is allowable at least by virtue of that dependency for the same reasons set forth in the response to the rejection of claim 24, above. Accordingly, the rejection of claim 25 should be withdrawn.

Claims 6, 7, 10, 16, 18 and 26

Claims 6, 7, 10, 16, 18 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dalal in view of Larson and further in view of U.S. Patent Number 6,032,144 to Srivastava et al. (hereinafter Srivastava). Applicant respectfully traverses the rejection.

These claims depend from claims that have been shown, above, to be allowable over Dalal. The addition of Larson and/or Srivastava to the analysis does not provide a reference that teaches or suggests partial aggregation or partial pre-aggregation.

As previously discussed, Larson is not available as prior art and, therefore, this rejection – to the extent that it relates to the Larson reference – is defective.

Srivastava describes a relational database system and a method for query processing using early aggregation. A collection of equivalence rules involving a multi-set version of a relational algebraic theta-semijoin operation is used to generate relational algebraic expressions equivalent to a computer programming language query. The expressions are used by way of example to describe a process that computes cost estimates for generated expressions. Based on the computed cost estimates, the least costly implementation of a complex query is determined and queries are cost-based optimized.

But Srivastava does not resolve the deficiency present in Dalal, to-wit: there is no teaching or suggestion of a partial pre-aggregation operation that is required by the rejected claims as a result of their dependencies.

Accordingly, these claims are allowable over the cited references and the rejection thereof should be withdrawn.

Conclusion

All pending claims 1-26 are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the subject application. If any issues remain that prevent issuance of this application, **the Examiner is urged to contact the undersigned attorney before issuing a subsequent Action.**

Respectfully Submitted,

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